# NISTTech

**Portable Fourier Transform Microwave Spectrometer with Cryogenic Receiver for Trace Gas Analysis**

## Description

The invention comprises a highly compact, portable, pulsed molecular-beam Fabry-Perot cavity Fourier transform microwave spectrometer which incorporates a cryogenically-cooled, low-noise amplifier in the receiving system that has been developed for trace gas analysis. The instrument design offers real-time analysis of trace-gas species in the parts per billion (volume) range. A user-friendly software package which employs a Graphical User Interface (GUI) has been written that allows complete mouse-driven instrument control with a standard 80486 processor based personal computer.

## Applications

- **Analysis:**
  Identifies trace gas, and concentration in a gas mixture

## Advantages

- **Features include:**
  Sensitive, 100ms detection limits; user friendly software; compact and portable

## Abstract

A highly compact, portable, pulsed-molecular-beam Fabry-Perot cavity Fourier transform microwave spectrometer which incorporates ultra-fine Fabry-Perot mirror surface finishes has been developed for trace gas analysis. The mirrors, having a surface finish of less than or equal to 0.25 microns rms, are coated with nickel and then with either gold or silver. In a further embodiment, one or more fixed-tuned Fabry-Perot cavities are incorporated within a single vacuum chamber to monitor one or more chemical species of interest.

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## References

- U.S. Patent # 5,831,439 issued 11/03/1998, Patent expired; nonpmt of maint fees; 11-29-2010
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## Status of Availability

This technology is available in the public domain.

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